

BLUE

SPLIT-2

23

Date: Wednesday, 5/16/2007 8:13:18 AM
 User: Kim Johnston

Process Sheet

Customer	CU-DAR001 Dart Helicopters Services	Drawing Name	02.500 SUPPORT	(split #1 6pc's)
Job Number	32374	Part Number	D28921	
Estimate Number	11058	Drawing Number	D2892 REV A	
P.O. Number	N/A	Project Number	N/A	
This Issue	5/16/2007	S.O. No.	N/A	
Prsh't Rev.	NC	Type	PURCHASED PARTS	
First Issue	N/A	Material	N/A	
Previous Run	28389	Due Date	6/5/2007	Qty: 16 Um: Each
Written By				
Checked & Approved By				
Comment	Est. C 02.11.26 Added P/O KJ			

Additional Product

Job Number:



Seq. #:	Machine Or Operation:	Description :	
1.0	PG	PURCHASING	
		Comment: PURCHASING Issue P/O: 3795 Description: D6104-003 Material: 17-4 PH SS (AMS 5643 OR AISI 630) as per Dwg D6104 Material release note required. Blank size makes (2) D2891-1	 C 207/05/17 (16)
2.0	D6104003	17-4 SS Roundbar 3.25"OD	
		Comment: Qty.: 1.0000 Each(s)/Unit Total : 16.0000 Each(s) Support	
3.0	PACKAGING 1	PACKAGING RESOURCE #1	
		Comment: PACKAGING RESOURCE #1 Recieve & Inspect for Transit Damage Ensure Material Release Note is attached	E 207/06/05 (16)
4.0	MORI SEIKI	MORI SEIKI CNC LATHE LARGE	
		Comment: MORI SEIKI LATHE Turn blank for Haas as per Folio FA082	PFD →
5.0	QC1	INSPECT ALL DIM TO DIM SHEET	
		Comment: INSPECT ALL DIM TO DIM SHEET	84 07/07/05

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: Date: 07/09/125
 QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
07/09/125	4.0	#1 support. Diameter of 2.524/2.529 was too small. Try to repast but come to big of 2.541.	IP 07.09.125 QSI 042	Acceptable to open bore up to Ø 2.541 MAX. SEE DS EMAIL.	JUL 09.12 07/09/15 X3	En 07/09/125 QSI 042	CP 07.09.125 07/09/15	En 07.09.125 07/09/125
		#2 support. Dia 2.524 a 2.529 was 2.533 and the support was too short.	IP 07.09.125 QSI 042	As per DS EMAIL	IP 07/09/125 QSI 042	CP 07.09.125 07/09/125	CP 07.09.125	IP 07.09.125
		#4 support. Too short the dia value of 2.524/2.529 was too big 2.531 #7 support: the dia of 2.529 was 2.530.	IP 07.09.125 PV QSI 042	As per DS Email	IP 07.09.125 07/09/125 QSI 042	CP 07.09.125 07/09/125 QSI 042	IP 07.09.125 07/09/125 QSI 042	IP 07.09.125 07/09/125 QSI 042

NOTE: Date & initial all entries

Date: Wednesday, 6/16/2007 8:13:18 AM
User: Kim Johnston

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services		Drawing Name: 02.500 SUPPORT
Job Number: 32374		Part Number: D28921
Job Number:		
Seq. #:	Machine Or Operation:	Description :
6.0	HAAS1	HAAS CNC VERTICAL MACHINING #1
Comment: HAAS Machine as per Folio FA082 Tumble & Deburr		<i>ark/J.F.</i> 07/07/05
7.0	QC2	INSPECT PARTS AS THEY COME OFF MACHINE
Comment: INSPECT PARTS AS THEY COME OFF MACHINE		<i>ark</i> 07/07/05 ⑥
8.0	QC8	SECOND CHECK
Comment: SECOND CHECK		<i>JUL 07-07-17 ⑥</i> <i>07/07/05</i>
9.0	SPRAY PAINTING	SPRAY PAINTING
Comment: SPRAY PAINTING -PRIME -PAINT DELFLEET BLUE -CLEAR DELFLEET		<i>P10: 4630</i> 06/09/20 ⑫ 07/07/05
10.0	QC14	INSPECT SPRAY PAINT
Comment: INSPECT SPRAY PAINT		<i>5</i> 07/07/04 (+6 sets) counter
11.0	PACKAGING 1	PACKAGING RESOURCE #1
Comment: PACKAGING RESOURCE #1 Identify and Stock Location: _____		<i>07/07/04</i> ⑫
12.0	QC21	FINAL INSPECTION/W/O RELEASE
Comment: FINAL INSPECTION/W/O RELEASE		07/07/05 ⑫
Job Completion		<i>U</i> 07/09/24

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____
 QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

DART AEROSPACE LTD	Work Order:	32374
Description: Ø2.500 Support	Part Number:	D2892-1
Inspection Dwg: D2892 Rev. A		Page 1 of 1

Inspect dimensions highlighted on inspection sheet drawing D2892 Rev. A/DSK077 Rev. A and record below:

				Recorded Actual Dimensions					
Dim	Min	Max	Go/No Go Gauge	1 ✓	2 ✓	3 ✓	4 ✓	By	Date
Lathe Section									
A	2.524	2.529		2.526	2.533	2.527	2.530		
B	3.702	3.722		3.717	3.700	3.718	3.680		
C	2.814	2.834		2.830	2.830	2.830	2.830		
D	0.718	0.738		.727	.727	.729	.727		
E	0.090	0.110		.097	.097	.091	.100		
F	2.714	2.734		2.726	2.726	2.727	2.727		
G	2.029	2.049		2.033	2.048	2.030	2.038		
H	3.214	3.234		3.226	3.226	3.226	3.228		
I	0.913	0.933		.920	.920	.920	.920		
J	0.022	0.042		.032	.032	.032	.032		
K	0.090	0.110		.096	.096	.094	.095		
L									
HAAS Section									
AA	0.115	0.135		0.134	0.134	0.133	0.134		
AB	0.290	0.310		0.303	0.305	0.305	0.305		
AC	0.040	0.060		0.051	0.052	0.052	0.052		
AD	0.115	0.135		0.128	0.128	0.128	0.128		
AE	0.240	0.260		0.252	0.255	0.251	0.253		
AF	0.188	0.193	DT8706	0.188	0.189	0.188	0.188		
AG	0.240	0.260		0.250	0.250	0.250	0.250		
AH	1.126	1.146		1.145	1.142	1.142	1.146		
AI	0.454	0.474		0.462	0.464	0.467	0.464		
AJ	0.240	0.260		0.250	0.250	0.250	0.250		
AK	0.053	0.073		0.063	0.063	0.063	0.063		
AL	0.257	0.262	DT8683	0.258	0.258	0.258	0.258		
AM	1.663	1.683		1.675	1.663	1.683	1.658		
AN	0.053	0.073		0.063	0.063	0.063	0.063		
AO	0.022	0.042		0.032	0.032	0.032	0.032		
AP	2.779	2.789		2.784	2.783	2.785	2.784		
AQ				2ml	2ml	2ml	2ml		
AR									
Accept/Reject									

Measured by:	8.8	✓	Audited by:	SPD	✓
Date:	07/22/12	07/09/12	Date:	07-09-12	

Rev	Date	Change	Revised by	Approved
A	02.12.12	New Issue	KJ/RF	#

DART AEROSPACE LTD

Work Order:

32374

Description: Ø2.500 Support

Part Number:

D2892-1

Inspection Dwg: D2892 Rev. A

Page 1 of 1

Inspect dimensions highlighted on inspection sheet drawing D2892 Rev. A/DSK077 Rev. A and record below:

				Recorded Actual Dimensions					
Dim	Min	Max	Go/No Go Gauge	5+	✓ 6-	✓ 73-	✓ 84-	By	Date
Lathe Section									
A	2.524	2.529		2.524	2.526	2.530	2.529		
B	3.702	3.722		3.703	3.710	3.709	3.710		
C	2.814	2.834		2.827	2.826	2.826	2.826		
D	0.718	0.738		.727	.732	.732	.730		
E	0.090	0.110		.095	.095	.095	.095		
F	2.714	2.734		2.728	2.724	2.728	2.726		
G	2.029	2.049		2.037	2.037	2.038	2.040		
H	3.214	3.234		3.227	3.227	3.227	3.226		
I	0.913	0.933		.925	.920	.920	.920		
J	0.022	0.042		.032	.032	.032	.032		
K	0.090	0.110		.104	.103	.104	.095		
L									
HAAS Section									
AA	0.115	0.135		1.32"	0.133	1.32"	1.32"		
AB	0.290	0.310		3.00"	0.305	3.00"	3.00"		
AC	0.040	0.060		.044"	0.045	.050"	.044"		
AD	0.115	0.135		.125"	.128	.127"	.125"		
AE	0.240	0.260		.250"	0.249	.245"	.245"		
AF	0.188	0.193	DT8706	.188"	0.188	0.188"	0.188"		
AG	0.240	0.260		R.250"	R.250	R.250"	R.250"		
AH	1.126	1.146		1.146"	1.146	1.146"	1.142"		
AI	0.454	0.474		.464"	0.465	.463"	.464"		
AJ	0.240	0.260		R.250"	R.250	R.250"	R.250"		
AK	0.053	0.073		R.053"	0.063	R.063"	R.053"		
AL	0.257	0.262	DT8683	0.257"	0.258	0.257"	0.257"		
AM	1.663	1.683		1.666"	1.673	1.676"	1.671"		
AN	0.053	0.073		R.063"	0.063	R.063"	R.063"		
AO	0.022	0.042		R.032"	0.032	R.032"	R.032"		
AP	2.779	2.789		2.788"	2.785	2.788"	2.788"		
AQ				GR2					
AR									
Accept/Reject									

Measured by:

Date:

S8 / J.F./am
07/06/18 07/07/05

Audited by:

Date:

CJ/07-09-17

Rev	Date	Change	Revised by	Approved
A	02.12.12	New Issue	KJ/RF	#

DART AEROSPACE LTD	Work Order:	32374
Description: Ø2.500 Support	Part Number:	D2892-1
Inspection Dwg: D2892 Rev. A		Page 1 of 1

Inspect dimensions highlighted on inspection sheet drawing D2892 Rev. A/DSK077 Rev. A and record below:

				Recorded Actual Dimensions					
Dim	Min	Max	Go/No Go Gauge	9 ✓	10.1	11.3 ✓	12.4 ✓	By	Date
Lathe Section									
A	2.524	2.529		2.528	2.529	2.530	2.527		
B	3.702	3.722		3.710	3.709	3.707	3.704		
C	2.814	2.834		2.827	2.826	2.832	2.830		
D	0.718	0.738		.728	.738	.733	.735		
E	0.090	0.110		.100	.099	.098	.095		
F	2.714	2.734		2.727	2.727	2.727	2.727		
G	2.029	2.049		2.035	2.044	2.036	2.034		
H	3.214	3.234		3.228	3.226	3.228	3.229		
I	0.913	0.933		.930	.925	.920	.920		
J	0.022	0.042		.032	.032	.032	.032		
K	0.090	0.110		.101	.101	.101	.098		
L									
HAAS Section									
AA	0.115	0.135		,133"	,133"		,132"		
AB	0.290	0.310		,300"	,300"		,300"		
AC	0.040	0.060		,053	,042"		,051"		
AD	0.115	0.135		,129	,127"		,126"		
AE	0.240	0.260		,249	,251"		,250"		
AF	0.188	0.193	DT8706	,188	,189"		,189"		
AG	0.240	0.260		,250	R,250"		R,250"		
AH	1.126	1.146		,140	,145"		,146"		
AI	0.454	0.474		,459	,464"		,463"		
AJ	0.240	0.260		,250	R,250"		R,250"		
AK	0.053	0.073		,063	,053"		,053"		
AL	0.257	0.262	DT8683	,258	,257"		,258"		
AM	1.663	1.683		,673	,671"		,670"		
AN	0.053	0.073		,063	R,063"		R,063"		
AO	0.022	0.042		,032	R,032"		R,032"		
AP	2.779	2.789		2.784	2.788"		2.788"		
AQ				2ml					
AR									

Accept/Reject

Measured by:	<i>J.F. 10ml</i>	Audited by:	
Date:	<i>07/06/11</i>	Date:	<i>07/07/05</i>

Rev	Date	Change	Revised by	Approved
A	02.12.12	New Issue	KJ/RF	#

DART AEROSPACE LTD	Work Order:	32374
Description: Ø2.500 Support	Part Number:	D2892-1
Inspection Dwg: D2892 Rev. A		Page 1 of 1

Inspect dimensions highlighted on inspection sheet drawing D2892 Rev. A/DSK077 Rev. A and record below:

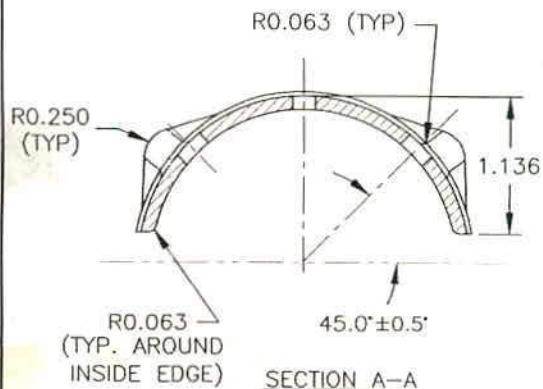
				Recorded Actual Dimensions					
Dim	Min	Max	Go/No Go Gauge	13	2	3	4	By	Date
Lathe Section									
A	2.524	2.529	2.528	2.528					
B	3.702	3.722	3.704	3.704					
C	2.814	2.834	2.824	2.824					
D	0.718	0.738	0.720	0.720					
E	0.090	0.110	0.091	0.095					
F	2.714	2.734	2.722	2.722					
G	2.029	2.049	2.037	2.039					
H	3.214	3.234	3.224	3.224					
I	0.913	0.933	0.920	0.920					
J	0.022	0.042	0.032	0.032					
K	0.090	0.110	0.091	0.095					
L									
HAAS Section									
AA	0.115	0.135		0.132"					
AB	0.290	0.310		0.300"					
AC	0.040	0.060		0.049"					
AD	0.115	0.135		0.125"					
AE	0.240	0.260		0.250"					
AF	0.188	0.193	DT8706	0.188"					
AG	0.240	0.260		0.250"					
AH	1.126	1.146		1.132"					
AI	0.454	0.474		0.463"					
AJ	0.240	0.260		0.250"					
AK	0.053	0.073		0.063"					
AL	0.257	0.262	DT8683	0.258"					
AM	1.663	1.683		1.670"					
AN	0.053	0.073		0.063"					
AO	0.022	0.042		0.032"					
AP	2.779	2.789		2.787"					
AQ									
AR									
Accept/Reject									

Measured by:	<i>S.S.</i>	<i>J.F.</i>	Audited by:	
Date:	<i>07/06/18</i>	<i>07/07/08</i>	Date:	

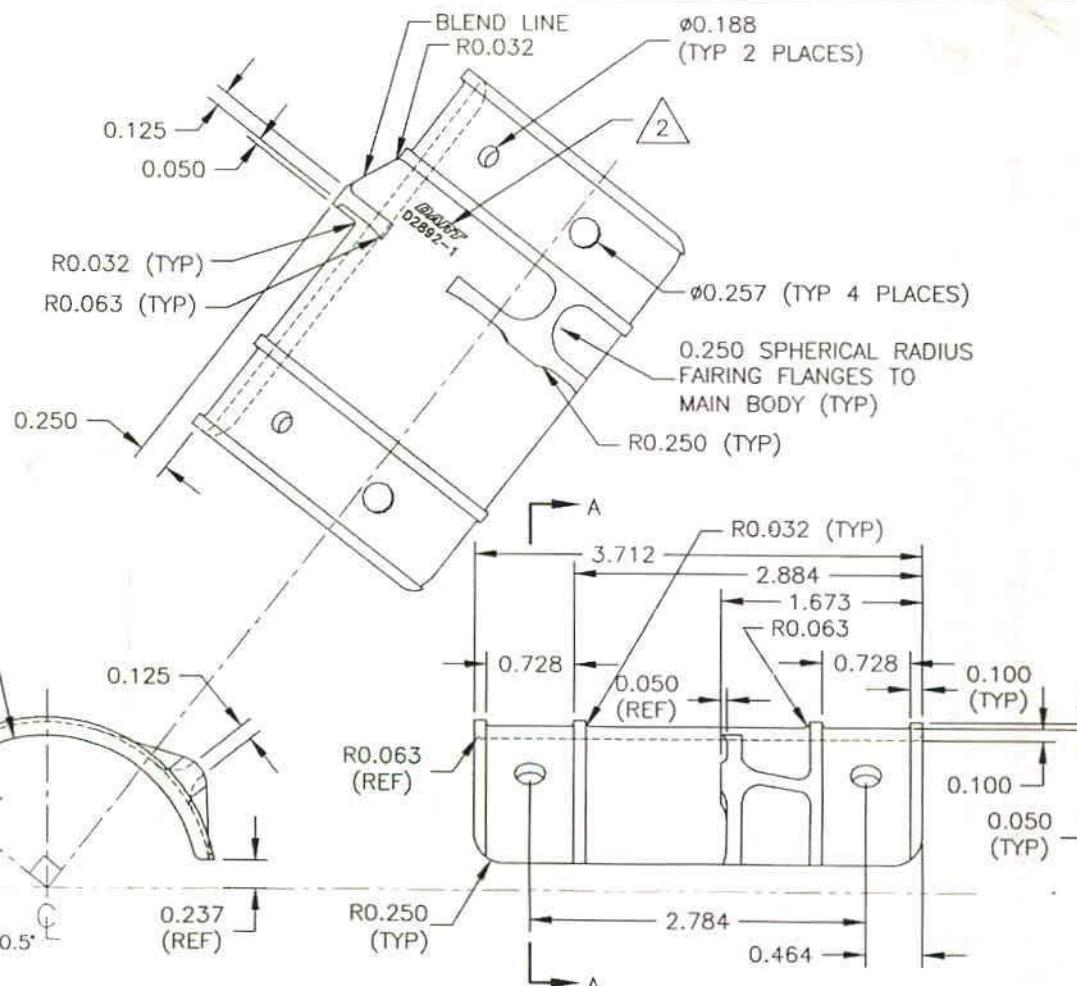
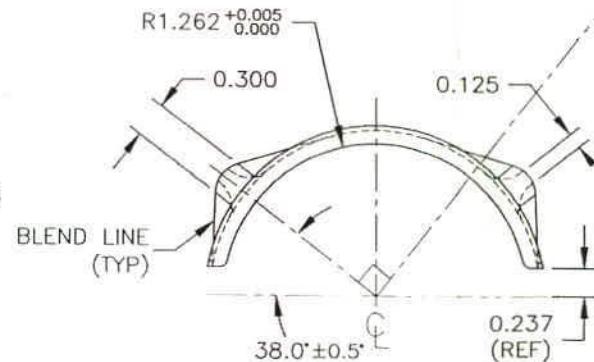
Rev	Date	Change	Revised by	Approved
A	02.12.12	New Issue	KJ/RF	#

D2892-1

- 1) MATERIAL: 17-4 PH STAINLESS STEEL
HEAT TREAT TO H900 CONDITION
(900°F FOR 1 HR, AIR COOL)
MIN UTS = 170 KSI (38 HRc)
- 2) IDENTIFY WITH DART LOGO (PER DART SUPPLIED GRAPHIC) AND PART NUMBER IN THIS AREA WITH 0.125 HIGH LETTERING 0.010-0.020 DEEP
- 3) BREAK ALL UNMARKED SHARP EDGES 0.010 TO 0.020
- 4) PART IS SYMMETRIC ABOUT CENTERLINE
- 5) TOLERANCES ARE PER DART QSI 018 (REF. X.XXX = ± 0.010) UNLESS OTHERWISE NOTED
- 6) ALL DIMENSIONS ARE IN INCHES
- 7) FINISH: POWDER COAT WHITE (REF. 4.3.5.2) PER DART QSI 005 4.3



SECTION A-A



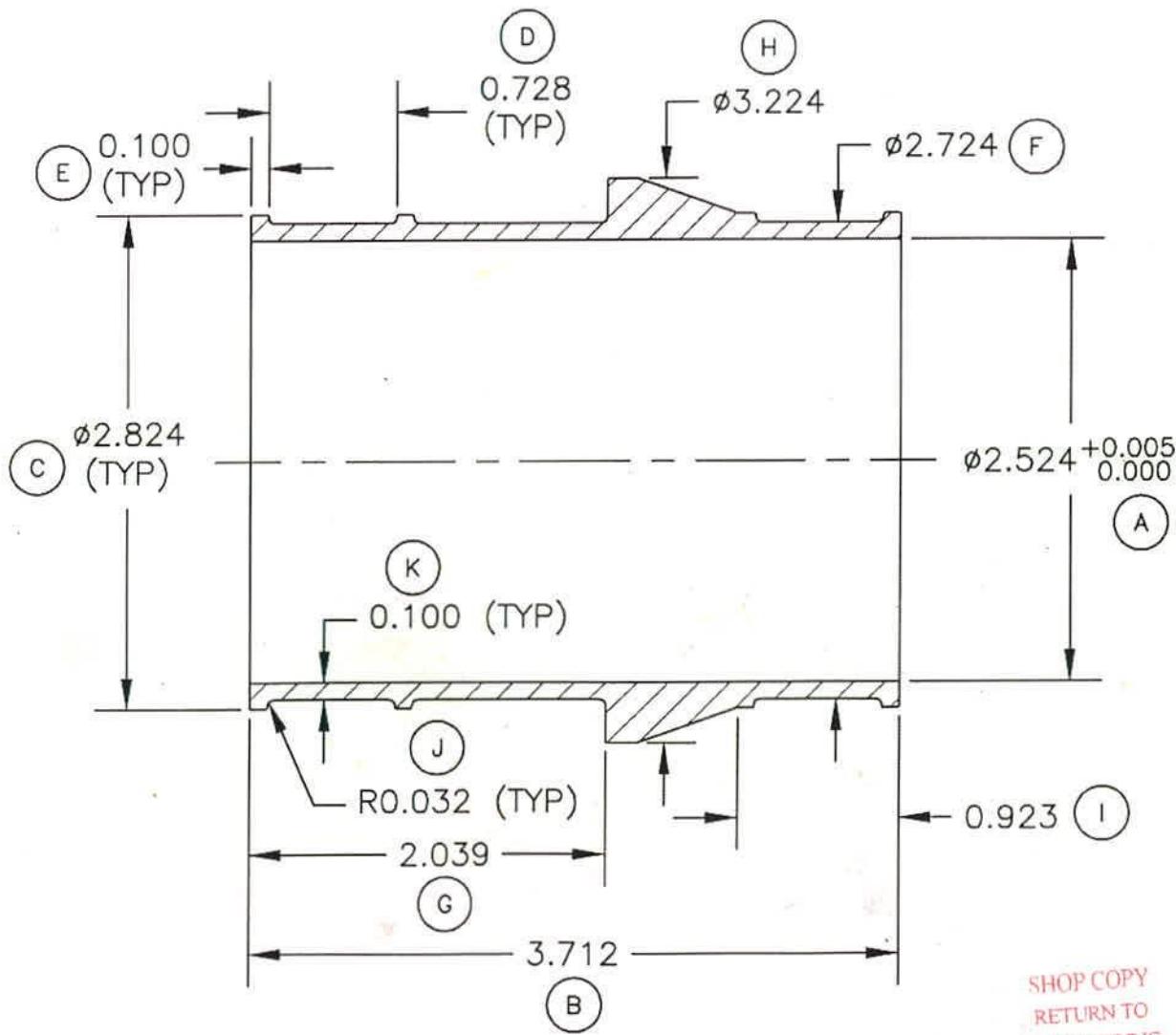
A	00.11.17	NEW ISSUE
DESIGN	DRAWN BY	DART
CP	CP	DART
CHECKED	APPROVED	DRAWING NO.
		D2892
DATE	TITLE	REV. A
00.11.17	Ø2.500 SUPPORT	SHEET 1 OF 1
		SCALE
		1:1

SHOP COPY
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ENGINEERING
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NO. 32374
WORK ORDER

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DART

DESIGN RF	DRAWN BY RF	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA
CHECKED <i>[Signature]</i>	APPROVED <i>[Signature]</i>	DRAWING NO. DSK 077
DATE 03.05.20		TITLE TURNING DETAIL FOR D2892-1
		SCALE 1:1
A	03.05.20	NEW ISSUE

RELEASED
03.07.01 *[Signature]*D2892-1 TURNING DETAIL

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552292	931733	01	Metaux Castle	A.M. CASTLE & Co. (Canada) Inc.	EXPÉDIÉ 21 MAI 2007		
EQUISITION CLIENT-CUSTOMER REQUISITION NO.			NO. COM. CLIENT-CUST. ORD. NO.		COMPTÉ-ACCT. VEND.-SLS TERR. EXPÉDIE PAR-SHIP VIA		
			3795		91037 200 40 CABANO (PPD)		
TEUR-PURCHASING AGENT INDA LACELLE	TELEPHONE 613 632-3336	H/C 9 0	TAXE NO. COM ORD 1	REGION LIVRAISON-DEL ZONE C/C	F.A.B.-F.O.B. PREPAID	BILL	NO. FEVILLE/EMBALLAGE-B/L NUMBER A105024 A105024
E-A-SHIP TO:	VENDU A-SOLD TO: DART AEROSPACE LTD 1270 ABERDEEN HAWKESBURY ON K6A 1K7				INFORMATION CRÉDIT-CREDIT INFORMATION Opéré par / Operated by: TRANSPORT TFI 5 SEC • NIR : R564638-6		
RECTIONS/LIVRAISON-DELIVERY NO-E55353	INSTRUCTIONS LIVRAISON (CONT.)-DELIVERY (CONT'D.)				IN:  19048584-1 kingsway		
SCRIPTION - ITEM 1 -2500 RD 17CR-4NI RT SOL. TREATED COND A 3.80" GOLD						QTE/UNITE COM.-ORDERED 32 PCS	POIDS COM.-WT. ORDERED 286 PCS
INSTRUCTIONS TOL + 1/8" - 0 PRIOR DIST/ORD: 01 931733						BALLOTS-BUNDLES 1	POIDS EXP.-WT. SHIPPED 286
CERTIFICAT DE CONFORMITE See Packing Slip for English Certificate of Conformance A.M. Castle & Co. (Canada) Inc. certifie que la material fourni l'après ce document rencontrera et est conforme aux spécifications du produit(s) descript(s) ci-contre. A.M. Castle & Co. (Canada) Inc.						COULÉE INFO-HEAT INFO QTE-QTY G9723 ✓ 20	FORME-SHAPE I.A.C. 42470
						A18564 6055 11	
						A18289 1 28.210FT	
INSTRUCTIONS (CONT'D.) 32x3.825"						ENT-WH	
SCRIPTION - ITEM 2						QTE/UNITE COM.-ORDERED BALLOTS-BUNDLES	POIDS COM.-WT. ORDERED POIDS EXP.-WT. SHIPPED
INSTRUCTIONS 1 Box						COULÉE INFO-HEAT INFO QTE-QTY INSTRUCTIONS (CONT'D.) 31-5-07 3285002	FORME-SHAPE I.A.C. ENT-WH
TERMES ET CONDITIONS V.N.S DES AVENUES GARANTIES ET RESTRICTION DE RESPONSABILITÉ AU VERSO PREPARD							
SCRIPTION - ITEM 3 S / Métaux Castle 835 Selkirk Pointe-Claire, Québec H9R 3S2 3066442						QTE/UNITE COM.-ORDERED BALLOTS-BUNDLES	POIDS COM.-WT. ORDERED POIDS EXP.-WT. SHIPPED
INSTRUCTIONS 1 Box						COULÉE INFO-HEAT INFO QTE-QTY 286 #	FORME-SHAPE I.A.C. ENT-WH
INSTRUCTIONS INSTRUCTIONS (CONT'D.)							
NOTES DIFFÉRENCES: LES DIFFÉRENCES DOIVENT ÊTRE INDICQUÉS SUR LA COPIE REÇUE/LIVRAISON ET LA FEVILLE D'EMBALLAGE ET IGNÉE POUR CONFIRMATION DU CLIENT QU'UNE COMMANDE SEULEMENT DOIT ÊTRE SOUMIS DANS LES 10 JOURS ORSQU'UN CRÉDIT EST REQUIS.						RECU/LIVRAISON - DELIVERY RECEIPT END	
NOM (LETRE MOULEE)-NAME (PRINT ONLY)			DATE RECUE- DATE RECEIVED				
RECU PAR-RECEIVED BY							

06-06-'07 09:37 FROM-metaux castle

514-695-3281

T-635 P004/005 E-254

SP 425, 50-A



P.O. BOX 977
SYRACUSE
NEW YORK 13201

CERTIFICATE OF TEST

				SHIP TO		SHIPPING ADDRESS		SHIPPED FROM		CUST ORDER NO.	
S	A M CASTLE, INC	S	A M CASTLE, INC							P-5-17126-6-1	
O	3400 N WOLF RD	I	3400 N WOLF RD							DATE	
D	FRANKLIN PARK, IL 60131	T	FRANKLIN PARK, IL 60131							42 23-67	

CUSTOMER ORDER # & DATE

CUSTOMER REQ. #

DISTRICT

B PARSONS

SHIPPED

FROM SYRACUSE

DESCRIPTION OF MATERIAL

SIZE

CRU 17-4PH RT A IAC 42470
 ANC 3174-10 REV 7 ASME-SA564-04ED 1630 ASIN-A564-04 1630
 AHS-56430 (EX SURFACE) HTSI 630 UNS-S17400

HEAT NO.

CHEMICAL ANALYSIS

A10364	C .034	H/N .68	P .030	S .018	Si .45	Ni 1.04	Cr 15.20	Mo .11	Co 3.13	CB .26	Ti .310
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CASTLE METALS FP
 DATE REC'D 5/9/07 IAC 42470
 APPROVED BY: SPW

QUANTITY HEAT NO.

MECHANICAL PROPERTIES

1187 # A10364	TENSILE PSI 710,22PSI	ELONGATION % 26	RED/AREA % 100%	HARDNESS BHN 350
CAPABILITY PHYSICALS AFTER 900 DEG. F. - 1 HR. AIRCOOLED	203.660	160.640	12.3	53.3
				BHN 312

MACRO TEST OK

FERRITE 3 %

MAGNAFLUX P/9 = 0/0

REDUCTION RATIO: 27.511
 MATERIAL SOLUTION TREATED AT 1900 DEG. F. HELD 45 MINUTES AT TEMPERATURE
 AIRCOOLED.

CRUCIBLE MATERIALS CORP. VENDOR #18510,
 MATERIAL INGOT CAST.
 NAFTA ~ YES

MATERIAL FREE FROM MERCURY CONTAMINATION AT TIME OF SHIPMENT
 NO WELD REPAIR PERFORMED
 MATERIAL MELTED IN U.S.A.

THANK YOU FOR SELECTING A QUALITY PRODUCT
 MANUFACTURED BY THE EMPLOYEES OF CRUCIBLE SPECIALTY METALS

THE ABOVE MATERIAL WAS MANUFACTURED AND TESTED IN ACCORD
 WITH ABOVE SPECIFICATIONS AND IS IN CONFORMANCE WITH
 SPECIFICATION REQUIREMENTS.

CRUCIBLE MATERIALS CORPORATION
 ACTING BY AND THROUGH ITS SPECIALTY METALS DIVISION

SWORN TO AND SUBSCRIBED BEFORE ME THIS

DAY OF 20

CERTIFIED
BY:

QUALITY ASSURANCE REPRESENTATIVE

06-06-'07 09:37 FROM-metaux castle

514-695-3281

T-635 P005/005 E-254



SYRACUSE
NEW YORK 13201

CERTIFICATE OF TEST

S
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O
A M CASTLE, INC
3400 N WOLF RD
FRANKLIN PARK, IL 60131

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A M CASTLE, INC
3400 N WOLF RD
FRANKLIN PARK, IL 60131

OUR ORDER NO.
PS-17223-6-F
DATE
03/14/07

CUSTOMER ORDER # & DATE

CUSTOMER REQ. #

DISTRICT

SHIPPED
FROM

SYRACUSE

01-21367

DESCRIPTION OF MATERIAL

CRU 17-4PH RT A IAC 42470

SIZE

3.250 RD

AMC-3174-10 REV 7 ASME-SA564-04ED T630 ASTM-A564-04 T630
AMS-5643Q (EX SURFACE) AISI 630 UNS# S17400

HEAT NO.

CHEMICAL ANALYSIS

A18289	C	MN	P	S	SI	NI	CR	MO	CU	CB	T ₆
	.046	.50	.027	.021	.61	4.17	15.11	.14	3.38	.27	.00%

CASTLE METALS CORP.

DATE RCVD 3/15/01IAC 42470APPROVED BY JL

QUANTITY

HEAT NO.

MECHANICAL PROPERTIES

678 # A18289 TENSILE PSI YLD.2%PSI XELONG2IN RED/AREA HARDNESS BHN 363

CAPABILITY PHYSICALS AFTER 900 DEG. F. - 1 HR. AIRCOOLED
204,770 179,850 13.8 52.6 DHN 415

MACRO TEST OK

FERRITE 3 %

MAGNAFLUX F/S = 0/0

REDUCTION RATIO: 27.5:1

MATERIAL SOLUTION TREATED AT 1900 DEG. F. HELD 45 MINUTES AT TEMPERATURE - AIRCOOLED.

CRUCIBLE MATERIALS CORP. VENDOR #18610.

MATERIAL INPUT CAST.

MATERIAL FREE FROM MERCURY CONTAMINATION AT TIME OF SHIPMENT
NO WELD REPAIR PERFORMED
MATERIAL MELTED IN U.S.A.

MANUFACTURED BY THE EMPLOYEES OF CRUCIBLE SPECIALTY METALS

THE ABOVE MATERIAL WAS MANUFACTURED AND TESTED IN ACCORD WITH ABOVE SPECIFICATIONS AND IS IN CONFORMANCE WITH THE SPECIFICATION REQUIREMENTS.

CRUCIBLE MATERIALS CORPORATION
ACTING BY AND THROUGH ITS SPECIALTY METALS DIVISION

SWORN TO AND SUBSCRIBED BEFORE ME THIS

DAY OF , 20
NOTARY PUBLIC

QUALITY ASSURANCE REPRESENTATIVE

JACKIE L. WHITE - SPECIFICATION EXAMINER

CERTIFICATE OF TESTS
 CERT SERIAL# 000479979

 Talley Metals Technology, Inc.
 P.O. Box 2498
 Harrisville, SC 29551 Tel: 843.335.7540 Fax: 843.335.6465

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 12/10/04
CUSTOMER/BESTELLER/CLIENT
SELLER/VERKAUFER/VENDEUR PAGE 1 OF 2

 A.M. CASTLE & CO
 3400 N WOLF RD
 FRANKLIN PARK , IL 60131

HVL

CUSTOMER ORDER NO./BESTELL-NR./N° DE COMMANDE	CARPENTER NO./WERKS-NR./N° DE REFERENCE INTERNE	DATE/DATUM/DATE	WEIGHT /GEWICHT/Poids
01-28383-01	W67226	12/10/04	915:

HEAT NUMBER / SCHMELZE-NR. / N° DE COULEE : G9723

 PRODUCT DESCRIPTION: TYPE 17-4 SOLUTION ANNEALED ROUGH TURNED
 PART NUMBER: IAC 42470

 SPECIFICATION: CASTLE 3174-10 CAP OF COND. H900 REV. 5 (02/18/04)
 AMS 5643 REV Q (01/703) (UNS S17400) (AISI 630)
 ASTM-A564-04
 ASME-SA564 2001 EDITION

SIZE 3.250000 IN. (82.55 MM) RD BAR

PRIMARY HEAT CHEMISTRY(WT%):

C	MN	SI	P	S	CF
0.03	0.84	0.48	0.019	0.026	15.32
NI	MO	CU	N	CB	PP
4.42	0.29	3.61	0.032	0.25	0.01

CB+TA
0.26

 THIS HEAT MELTED BY THE ARC/AOD PROCESSES
 NO WELD REPAIR.
 MATERIAL IS MANUFACTURED FREE FROM MERCURY, RADIUM AND ALPHA SOURCE
 CONTAMINATION.

DISCS MACROETCHED AND APPROVED

HARDNESS AS SHIPPED, HB - 321 (MIDRADIUS)

MAGNETIC PARTICLE: FREQUENCY = 0 / SEVERITY = 0

MICROSTRUCTURE - FERRITE 1.60% CASTLE METALS FT

 SOLUTION ANNEALED 1900 F - 1 HOUR - RAPID COOL
 HOT REDUCTION RATIO: 8:1
 MATERIAL WAS MELTED AND MANUFACTURED IN THE USA.

DATE REC'D 12.15.04/IAC42470

 APPROVED BY [Signature]

CONTINUED ON NEXT PAGE

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CERTIFICATE OF TESTS
 CERT SERIAL# 000479979


Talley Metals Technology, Inc.
 P.O. Box 2498
 Harsville, SC 29551 Tel: 843.335.7540 Fax: 843.335.6465

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12/10/04
CUSTOMER/BESTELLER/CLIENT

SELLER / VERKÄUFER / VENDEUR PAGE 2 OF 2

A.M. CASTLE & CO
 3400 N WOLF RD
 FRANKLIN PARK , IL 60131

HVL

CUSTOMER ORDER NO./BESTELL-NR./N° DE COMMANDE	CARPENTER NO./WERKS-NR./N° DE REFERENCE INTERNE	DATE/DATUM/DATE	WEIGHT/GEWICHT/Poids
01-28383-01	W67226	12/10/04	9153

HEAT NUMBER / SCHMELZE-NR. / N° DE COULEE : G9723
 CAPABILITY

900 F (482 C), 01 HR AIR COOL

YIELD STRENGTH, (0.20 %) KSI(MPA)	192.0 (1324)
TENSILE STRENGTH, KSI(MPA)	202.0 (1393)
ELONGATION IN 2.00", %	13.0
REDUCTION OF AREA, %	46.0
HARDNESS , HB	401.0

(CONVERTED FROM TENSILE STRENGTH)

WE HEREBY CERTIFY THAT THE ABOVE TEST DATA ARE IN ACCORDANCE WITH THE PURCHASE ORDER AND SPECIFICATION REQUIREMENTS.

TIMOTHY DUVALL
 QUALITY ASSURANCE REP.
 CARPENTER TECHNOLOGY CORPORATION

Timothy M. Duvall

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Chris Provencal

From: David Shepherd [dshepherd@dart Aero.com]
Sent: July 17, 2007 6:52 PM
To: 'Chris Provencal'
Cc: 'Marc Bellavance'
Subject: RE: NCR D2892 Support

Chris,

Thanks for your email.

I think the parts are acceptable.

I think the blank should be cut along the 2.541 ellipse so that the support does not pinch the tube, even if the part gets slightly stressed on installation.

I think this is the better way to go because the support is essentially non-structural.

David

From: Chris Provencal [mailto:cprovencal@dart Aero.com]
Sent: Thursday, July 12, 2007 10:58 AM
To: '*David Shepherd (*David Shepherd)'
Cc: 'Marc Bellavance'
Subject: NCR D2892 Support

David,

I discussed this with you on the phone a few days ago. Qty(2) D2892-1 Supports: The turned blank got slightly crushed in the chuck. The attached picture shows the worst one (2.529 x 2.541 ellipse). The nominal OD should be 2.524 +0.010/-0.000. We can cut along the narrowest section, the support might pinch the tube because of the bigger OD in the other direction.

Additionally the overall length on one of them is short: 3.679" instead of 3.712".

-Chris

No virus found in this incoming message.

Checked by AVG Free Edition.

Version: 7.5.476 / Virus Database: 269.10.8/904 - Release Date: 7/16/2007 5:42 PM

No virus found in this outgoing message.

Checked by AVG Free Edition.

Version: 7.5.476 / Virus Database: 269.10.8/904 - Release Date: 7/16/2007 5:42 PM